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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,045	08/07/2003	James E. C. Brown	RAD344	9959

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EXAMINER	
ZHENG, EVA Y	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/636,045	BROWN ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/7/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 7, 18, 19, 10, 11, 17, 8, 9, and 20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 5, 6, 8, 9, 12, 13, 14, and 16 of copending Application No. 10,350,622. Although the conflicting claims are not identical, they are not patentably distinct from each other because the broader application claims would have been obvious in view of the narrow claims, as follows:

a) Regarding claim 1,

resolving an incoming signal into said I and Q signals;

computing (packet) fixed correction coefficients from said I and Q signals for a certain time period of said incoming signal; and

after said certain time period, correcting I/Q gain and I/Q phase of said I and Q signals with said (packet-fixed) correction coefficients for providing corrected said I and Q signals.

b) Regarding claim 7,

the step of computing (packet) fixed correction coefficients includes computing first and second correction coefficients using a finite number of indexed I values for said I signal and said finite number of indexed Q values for said Q signal; where

a first term includes a cross correlation of said I values and said Q values;

a second term includes an autocorrelation of said Q values;

a third term includes said first term divided by said second term;

a fourth term includes a sum of absolute values of said Q values;

a fifth term includes a sum of absolute values of a difference of said I values minus a product of said Q values times said third term; and

said first correction coefficient includes said fourth term divided by said fifth term.

c) Regarding claim 18,

said second correction coefficient includes the negative of said third term.

d) Regarding claim 19,

said second correction coefficient includes a negative of a product of said first correction coefficient and said third term.

e) Regarding claim 10,

demodulating said corrected I and Q signals for estimating data carried on said incoming signal.

f) Regarding claim 11,

a quadrature converter for resolving an incoming signal into said I and Q signals;

an IQ coefficient calculator for computing (packet) fixed correction coefficients from said I and Q signals for a certain time period of said incoming signal; and

an IQ balancer for using said (packet-fixed) correction coefficients for correcting I/Q gain and I/Q phase of said I and Q signals after said certain time period and providing corrected said I and Q signals.

g) Regarding claim 17,

the IQ coefficient calculator computes first and second said correction coefficients using a finite number of indexed I values for said I signal and said finite number of indexed Q values for said Q signal; where

a first term includes a cross correlation of said I values and said Q values;

a second term includes an autocorrelation of said Q values;

a third term includes said first term divided by said second term;

a fourth term includes a sum of absolute values of said Q values;

a fifth term includes a sum of absolute values of a difference of said I values minus a product of said Q values times said third term; and

said first correction coefficient includes said fourth term divided by said fifth term.

h) Regarding claim 8,

said second correction coefficient includes the negative of said third term.

i) Regarding claim 9,

said second correction coefficient includes a negative of a product of said first correction coefficient and said third term.

k) Regarding claim 20,

a digital IQ signal receiver for demodulating said corrected I and Q signals for estimating data carried on said incoming signal.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 7-9 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 7 and 17, the recitation: "a fifth term.....said third term" is confusing for carrying out fifth tem algorithm.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-6, 10-16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuenen et al. (US 2004/0063416 A1).

a) Regarding claims 1, Kuenen et al. disclose a method for automatic I/Q balancing for packets of an incoming signal, comprising:

resolving said incoming signal into said I and Q signals (110 in Fig. 1);

computing fixed correction coefficients from said I and Q signals during a measurement section for a packet (211, 212, 214, 215, and 217 in Fig. 2); and

correcting at least one of I/Q gain and I/Q phase of said I and Q signals (235 in Fig. 2; Col 4, 0034) with said correction coefficients for providing corrected said I and Q signals (230 in Fig. 2).

Kuenen et al. discloses all of the subject matter as described above except for the specifically teaching of packets of signals.

However, it is well known in a communication receiver that the digital I and Q signals are received as packets. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to recognize that the digital receiver by Kuenen et al. receives, computes, and corrects packets signals.

b) Regarding claims 2 and 12, Kuenen et al. discloses the method / the receiver further comprising:

delaying said I and Q signals by at least said measurement section (318 in Fig. 3; Col 3, 0030); and wherein the step of correcting includes correcting said at least one of said I/Q gain and said I/Q phase of said delayed I and Q signals (210 and 230 in Fig. 2)

with said packet-fixed correction coefficients for providing said corrected I and Q signals (as shown in Fig. 2).

c) Regarding claims 3 and 13, Kuenen et al. disclose

detecting pre-delay averages for said I and Q signals (211 and 212 in Fig. 2; Col 3, 0029) for a time period not greater than said certain time period before the step of delaying said I and Q signals; and

using said pre-delay averages for reducing DC offset from said delayed I and Q signals before the step of correcting said I and Q signals.

d) Regarding claim 4, Kuenen et al. disclose

the step of correcting includes using said packet-fixed correction coefficients for correcting said at least one of said I/Q gain and said I/Q phase (235 in Fig. 2) for a portion of said packet only after said measurement section (318 in Fig. 3) of said packet for providing said corrected I and Q signals (as shown in Fig. 2).

e) Regarding claim 14, Kuenen et al. disclose

the IQ balance uses said packet-fixed correction coefficients for correcting said at least one of said I/Q gain and said I/Q phase (235 in Fig. 2) for a portion of said packet only after said measurement section (318 in Fig. 3) of said packet for providing said corrected I and Q signals (as shown in Fig. 2).

f) Regarding claim 11, Kuenen et al. disclose a signal receiver having automatic I/Q balancing for packets of an incoming signal, comprising;

a quadrature converter for resolving an incoming signal into said I and Q signals (110 in Fig. 1);

an IQ coefficient calculator for computing fixed correction coefficients from said I and Q signals during a measurement section of a packet (211, 212, 214, 215, and 217 in Fig. 2); and

an IQ balancer for using said fixed correction coefficients for correcting at least one of I/Q gain and I/Q phase of said I and Q signals for providing corrected said I and Q signals. (230 in Fig. 2).

Kuenen et al. discloses all of the subject matter as described above except for the specifically teaching of packets of signals.

However, it is well known in a communication receiver that the digital I and Q signals are received as packets. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to recognize that the digital receiver by Kuenen et al. receives, computes, and corrects packets signals.

g) Regarding claim 10, Kuenen et al. disclose the method of claim 1, further comprising:

demodulating said corrected I and Q signals for estimating data carried on said incoming signal (140 in Fig. 1; Col 3, 0026).

h) Regarding claims 5 and 15, Kuenen et al. disclose

detecting averages for said I and Q signals for a time period not greater than said measurement section (211 and 212 in Fig. 2; Col 3, 0029); and

using said averages for reducing DC offset of said I and Q signals for a time period of said packet after said measurement section before the step of correcting said I and Q signals.

i) Regarding claim 6, Kuenen et al. disclose

the step of correcting said at least one of said I/Q gain and said I/Q phase is performed only after the step of computing said packet-fixed correction coefficients (as shown in Fig.2 and 3).

j) Regarding claim 16, Kuenen et al. disclose

the IQ balancer corrects said at least one of said I/Q gain and I/Q phase only after the IQ coefficients calculator calculates said packet-fixed correction coefficients (as shown in Fig.2 and 3).

k) Regarding claim 20, Kuenen et al. disclose the receiver of claim 11, further comprising:

a digital IQ signal receiver for demodulating said corrected I and Q signals for estimating data carried on said incoming signal (140 in Fig. 1; Col 3, 0026).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is 703-305-8699. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Eva Yi Zheng
Examiner
Art Unit 2634

August 10, 2004

SHUWANG LIU
PRIMARY EXAMINER